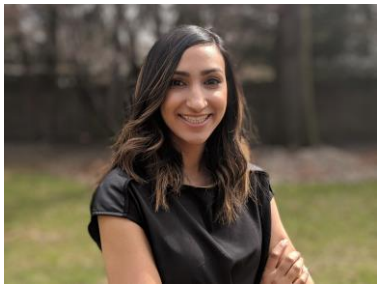

2019-2020 POCC Lecture Series

February 27, 2020, 7:30 PM

6:30 reception in the Nobel Hall

Dr. Niki R. Patel

Merck & Co.

Innovative Strategies toward Complex Molecule Synthesis: Development of a Fully Biocatalytic Manufacturing Route for Islatravir

Carolyn Hoff Lynch Lecture Hall Chemistry Building, University of Pennsylvania

The Philadelphia Organic Chemist's Club

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药明康德 WuXi AppTec

Niki Patel was born in Petersburg, VA and grew up in Philadelphia, PA. She conducted her undergraduate studies at Temple University, earning a B.S. in Chemistry in 2010. Following graduation, she went on to perform her doctoral studies under the supervision of Professor Robert Flowers at Lehigh University. In 2015, Niki moved to the University of Pennsylvania as a postdoctoral researcher in the laboratory of Professor Gary Molander. In 2017, Niki began working at Merck as a Senior Scientist within Process Research & Development.

Abstract: A staggering 37 million people are currently living with HIV worldwide, with more than 2 million individuals newly infected every year. There is, therefore, an urgent need for a simplified treatment for this highly infectious disease to improve the overall quality of patient lives. Islatravir (MK-8591), a nucleoside reverse transcriptase translocation inhibitor (NRTTI) is a uniquely suited compound due to its high efficacy and potency, which has the potential to improve the overall quality of life for patients. On the road to developing a highly sustainable and green commercial manufacturing route, the process chemistry team has employed biocatalysis to facilitate the synthesis of this nucleoside. In a novel transformation, an enzymatic cascade sequence is utilized for the preparation of the 4'-ethynyl-2'-deoxyribose sugar fragment of the molecule. In addition, a highly selective glycosylation reaction involving another enzymatic system is used to fuse the 2-fluoroadenine base to the sugar component. This talk will focus on the progress surrounding the development of this unparalleled manufacturing route, with an emphasis on the numerous challenges overcome by the team, leading to significant opportunities to develop a world-class fully biocatalytic manufacturing route for islatravir.